

HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM REPORT ON ROUTINE MANAGEMENT MEASURES TO ESTABLISH HARD CAPS IN THE DRIFT GILLNET FISHERY

Introduction

At its June 2014 meeting the Council directed the HMSMT to develop a range of alternatives to reduce the bycatch of protected species and finfish species encountered in the California large mesh swordfish/thresher shark drift gillnet (DGN) fishery. The Council instructed the HMSMT to consider a “hard cap” management system for protected species and to develop potential bycatch reduction strategies for finfish. A hard cap is a limit on the incidental take, or serious injury/mortality, for the selected species interactions. If the take level is met or exceeded, whether in an annual or multi-year context, the fishery would close for the remainder of the fishing season or calendar year. The HMSMT met August 12-14, 2014, at the NMFS Southwest Fisheries Science Center in La Jolla, California, to address this assignment.

To determine potential hard cap numbers the HMSMT was directed to consider, among other sources, information produced by NMFS to comply with both the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). NMFS already has Congressionally-mandated mechanisms in place to manage protected species bycatch through the MMPA’s Take Reduction Team process and the ESA’s Section 7 consultation process. Under the ESA process, a Biological Opinion (BiOp) may be prepared for an activity taking ESA-listed species. The BiOp contains an Incidental Take Statement (ITS), which is an estimate of the number of takes of ESA-listed species an activity is likely to take during a specific time period based on the anticipated effort level. Based on this estimate NMFS determines whether the activity is likely to “jeopardize the continued existence of any listed species.” Under the MMPA process, potential biological removal (PBR) levels are estimated for specified marine mammal stocks. PBR is defined (50 CFR 229.2) as the maximum number of animals, not including natural mortality, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. Given an ESA-listed marine mammal stock’s PBR level, and the estimated mortality and/or serious injury of that stock due to federally-managed fisheries, NMFS may issue an MMPA permit to a fishery under section 101(a)(5)(E) to take listed marine mammals as long as a negligible impact determination can be made.

The feasibility of a hard cap management system depends on monitoring fishing in real time. Protected species takes in the DGN fishery are rare events, so reliably estimating takes with an acceptable level of accuracy and precision is difficult without a high level of monitoring. Therefore, as part of this report the HMSMT has included a potential range of alternatives for fishery monitoring through at-sea observers and/or electronic means.

At their August meeting the HMSMT heard a presentation by Dr. Stephen Stohs of the Southwest Fisheries Science Center of a bootstrap simulation methodology under development to estimate the economic and bycatch impacts of different hard cap alternatives. Data sources for the project will include California Department of Fish and Wildlife (CDFW) DGN logbook data to characterize vessel-level effort per season; CDFW’s California Fisheries Information System landings data to estimate prices and weights for drift gillnet retained catch; NMFS’s DGN observer program data to estimate the distribution of set-level retained market catch and bycatch; and cost data collected in a 2008-2010 cost and earnings survey to quantify fixed and variable costs of DGN fishing. The method will use historical retained market finfish catch and bycatch data in DGN observer data to simulate levels of bycatch mortality and market species catch that could occur under different hard cap management scenarios. Cost and revenues data are used to convert retained finfish catch estimates into estimates of profitability. Dr. Stohs has indicated that preliminary results to demonstrate the method will be available for presentation and discussion at the September 2014 Council meeting.

Potential Range of Protected Species Hard Cap Alternatives for the DGN Fishery

In developing recommendations on hard cap alternatives, the HMSMT asked for, and received, Council approval to include alternatives that incorporate additional species not on the initial list provided by the Council and exclude species from that list if there is sufficient rationale to warrant such alterations. The species list initially identified by the Council were taken from the ITS in the 2013 BiOp for the DGN fishery and included fin, humpback, and sperm whales and leatherback, loggerhead, olive ridley, and green sea turtles. However, it should be noted that incidental take is a measure of the expected interactions in the DGN fishery based on factors (e.g., past interactions and estimated future effort) other than the conservation status of the species in question. In other words, takes that exceed the ITS level will not necessarily trigger a jeopardy determination. Similarly, there can be marine mammals not listed under the ESA (and thus not identified in the ITS) for which there is conservation concern because PBR is low and they have been previously encountered in the DGN fishery. Based on these considerations, the HMSMT structured the alternatives with different combinations of species for management consideration under a future hard cap system.

Under the four action alternatives described below, the HMSMT proposes the following two sub-options:

- Sub-option 1: Annual hard caps
- Sub-option 2: Hard caps calculated using rolling 5-year total (or some other agreed upon multi-year format/average)

Because takes are relatively rare events, the confidence interval around an estimate of actual take based on observed takes in a sample with less than 100% monitoring can be very wide. This could trigger a hard cap closure even if the “true” take level is significantly above or below the estimate. One way to increase the observer sample size to a more representative level would be to base hard caps on multiple-year tallies (i.e., rolling averages). The take estimates in the ITS are reported for a 5-year period and then converted to annual averages. Annual and 5-year take estimates are then converted to an observed take level based on the fraction of fishing effort expected to be observed. Using hard caps based on longer time periods, such as 5 years, could narrow the confidence interval around annual average take estimates, and would account for inter-annual variability associated with changing oceanographic conditions or fishing effort, assuming that 100% monitoring cannot be achieved in the near term. If a take in the current season, when added to observed takes in the previous four seasons, results in the hard cap being exceeded the fishery would then close. The method would have to consider when during the fishing season the ESA-listed species take occurred since total fishing effort is a factor in the equation for calculating estimated takes based on observed takes. One approach would be for the rolling total to be calculated on the calendar day (e.g., if an observed take occurred on September 15, 2016, the estimate would be based on the period from September 16, 2012).

The Council also needs to clarify whether hard cap closures are meant to apply to a calendar year or a fishing season. The DGN fishing season typically begins on August 15¹ each year and closes on January 31 of the following year. Hard caps based on calendar year would apply to the end of the previous season (January 1-31) and the first part of the next season (August 15-December 31).

¹ In some years the fishery begins as early as March but effort prior to August 15 has been historically very low due to regulatory constraints on area fished and unfavorable oceanographic conditions.

No Action Alternative: Status quo with continued management of protected species bycatch through established MMPA and ESA Federal processes.

Alternative 1: Hard caps for high priority protected species based on not exceeding the ITS. Species: fin, humpback and sperm whales; leatherback, loggerhead, olive ridley and green sea turtles.

As previously referenced, basing a hard cap management system strictly on the DGN fishery ITS is a very conservative approach which is not necessarily reflective of the conservation status of the species. Using an ITS-based system could close the fishery for a level of take below what would trigger a conservation response under the ESA.² While estimates of actual mortality levels may be accounted for when making a jeopardy determination under the ESA Section 7 process, the ITS reflects takes as well as mortalities. This is another reason why a hard cap, based solely on takes, may not accurately reflect the impact of protected species interactions on the population as a whole.

ITS-based hard caps are likely to result in further economic hardship for the DGN fleet at a time when vessel numbers, effort, and ex-vessel revenue are already at historic lows. These historic lows are based in-part on the existing regulatory regime for reducing protected species bycatch in the fishery, which the fleet has worked cooperatively with NMFS and the Council to implement. The measures put in place have resulted in fewer interactions since 2001, which in turn lowers estimates of the expected annual take and resulting ITS estimates. An ITS-based system could exacerbate the fleet economic viability issues by reducing profitable fishing opportunity while doing little to reverse the factors causing decline of some protected species of concern.

The conservative approach of using ITS estimates to establish take caps would reflect a Council recommendation to establish a higher standard for the DGN fishery in terms of protected species conservation than that applied to other fisheries under Council jurisdiction and under current Federal statutes. It would be important for the Council to describe what special circumstances in the DGN fishery warrants setting a higher standard.

Table 1 shows estimated takes presented in the DGN BiOp ITS. The HMSMT plans to provide recommendations on hard cap numbers based on ITS estimates in a supplemental report. As shown in Table 2, takes of fin whale, olive ridley sea turtle, and green sea turtle have not been observed since 2001. In fact, there has been only one observed take each of a fin whale, olive ridley and a green turtle in the last 23 years (1990-2013); therefore, it is a very rare event. In 1996, the Pacific Offshore Cetacean Take Reduction Team was formed and convened to reduce marine mammal bycatch. In October, 1997 requirements were imposed on the fishery to reduce marine mammal bycatch including the use of net extenders and pingers. With high compliance, these measures have reduced small cetacean bycatch by over 50% and there have been no beaked whales (protected species of concern at the time) observed taken since the regulations have been in place. In 2001 the Pacific Leatherback Conservation Area was established to reduce takes of this sea turtle species. Thus the period from 2001 forward better reflects operation of the fishery compared to data from prior years.

² The standard under the ESA is whether an activity 'jeopardizes the continued existence of a listed species.' If so, mandatory measures (including prohibiting the activity) may be imposed. While takes equal to the ITS would trigger a new BiOp (reinitiation of Section 7 consultation) they wouldn't necessarily result in a jeopardy determination.

Table 1. Amount and extent of take on individuals expected in the DGN fishery. (Source: ITS, Table 12, 2013 DGN Biological Opinion)

Species	Annual take	5-year take total	Expected mortalities** during 5-year period
Fin whale*	up to 1	up to 2	up to 1
Humpback whale	up to 2	up to 4	up to 2
Sperm whale	up to 2	up to 8	up to 6
Leatherback turtle	up to 3	up to 10	up to 7
Loggerhead turtle	up to 3	up to 7	up to 4
Olive ridley turtle*	up to 1	up to 2	up to 1
Green turtle*	up to 1	up to 2	up to 1

*No takes observed since 2001.

**Includes animals that may be determined to have experienced either serious injury or mortality as a result of interaction with the fishing gear.

†Hard cap values rounded to the nearest whole animal. Values less than <0.5 are rounded to 1 for practical purposes.

Table 2. Observed bycatch of ESA-listed individuals in the DGN fishery 2001-2013 since bycatch reduction measures have been in place (Sourced from 2013 DGN Biological Opinion)

Year	Month	Species	Condition
2001	August	Loggerhead sea turtle	alive
2004	November	Humpback whale	alive
2006	October	Loggerhead sea turtle	alive
2009	September	Leatherback sea turtle	alive
2010	December	Sperm whale	seriously injured
2010	December	Sperm whale	dead
2012	October	Leatherback sea turtle	alive

Alternative 2: Hard caps for selected marine mammals based on not exceeding PBR; hard caps for ESA-listed sea turtles based on not exceeding the ITS. Species: sperm, humpback, and short-fin pilot whales; leatherback and loggerhead sea turtles

This alternative uses PBR for marine mammals, which is estimated by the SWFSC Protected Resources Division in Pacific marine mammal stock assessments. PBR equals:

$$N_{\text{MIN}} * 1/2R_{\text{MAX}} * F_{\text{R}}$$

Where:

N_{MIN} is the minimum population estimate of the stock

$1/2R_{\text{MAX}}$ is half the maximum theoretical or estimate net productivity rate of the stock at a small population size; and

F_{R} is a recovery factor between 0.1 and 1.0

PBR is a fairly conservative estimate of the level of human-caused mortality that a population can sustain and still recover, particularly for ESA-listed marine mammals. The advantage of using PBR for hard cap management over the ITS estimates is that it is related to the status of the marine mammal stock and is thus more meaningful in terms of stock conservation and recovery. It is important to note that PBR is based on all sources of human-caused mortality. A fishery-specific hard cap would have to take into account other sources of mortality (both from other fisheries and non-fishing activities) if it is intended to

prevent the contribution from the activity (in this case the DGN fishery) from causing PBR to be exceeded. Estimates of annual mortality and/or serious injury (M/SI) from fishery and non-fishing activities are reported in the annual marine mammal stock assessment reports.

Table 3 reproduces information from the [Final 2013 U.S. Pacific Marine Mammal Stock Assessment Report](#) (SAR) (79 FR 49053, August 19, 2014) on serious injury/mortality related to human activity (fishing, ship strikes, etc.) and potential biological removals (PBR). Of the 14 species in Table 3, PBR is exceeded due to fishing mortality for sperm whale, but annual fishery mortality and serious injury is less than 50% of PBR for the remaining species. However, as discussed below, both the estimate of PBR and annual fishery mortality and serious injury for sperm whale are updated in the draft 2014 SAR; the new estimates indicate that PBR is not exceeded.

Table 3. PBR, total U.S. West Coast annual fishery mortality and/or serious injury mortality (M/SI), and M/SI as a percent of PBR for cetacean and pinniped stocks with previously documented DGN fishery interactions (Source: [Final 2013 SAR](#)).

Species	PBR	Annual Fishery M/SI**	PBR as % of Annual M/SI
Cetaceans			
Sperm whale	1.5*	3.8†	> PBR
Minke whale	2.0	0	0.0%
Common bottlenose dolphin, CA coastal	2.4	0.2	8.3%
Short-finned pilot whale	4.6	0	0.0%
Common bottlenose dolphin, CA, OR, WA Offshore)	(5.5	≥2.0	36.4%
Humpback whale	11	≥4.4	40.0%
Fin whale	16	0.6	3.8%
Risso's dolphin	39	1.6	4.1%
Northern right whale dolphin	48	3.6	7.5%
Pacific white sided dolphin	171	11.8	6.9%
Common dolphin, long beaked	610	13	2.1%
Common dolphin, short beaked	3440	64	1.9%
Pinnipeds			
Northern elephant seal	4382	≥8.8	0.2%
California sea lion	9200	≥337	3.7%

* PBR for sperm whales will be updated in the draft 2014 stock assessment report, to 2.7.

**Includes the 5-year average SI/M estimate from all West coast fisheries

†Fisheries SI/M estimates for sperm whales will be updated in the draft 2014 stock assessment report to include an estimate for a longer time period than the current 5-year average, to account for rare events.

Based on the analyses prepared for the proposed draft 2014 SAR, presented at the SRG meeting in April, 2014, and analyzed in a SWFSC Technical Memorandum³ and a forthcoming article in Endangered Species Research (Moore and Barlow, *in press*), the stock assessment for sperm whales has been revised. Major revisions include:

³ Carretta, J.V. and J.E. Moore. 2014. Recommendations for Pooling Annual Bycatch Estimates when Events are Rare. NOAA Tech. Memo. NOAA-TM-NMFS-SWFSC-528. June 2014.

Nmin/PBR: Using a trend-based analysis from the 1991-2008 time series (Moore and Barlow *in press*), the revised Nmin is **1,332** whales (**up from 751 whales**), with a revised PBR of **2.7** (**up from 1.5**).

M/SI: Using estimated M/SI of sperm whales in the DGN fishery from 2001-2012, the mean annual SI/M bycatch estimate is **1.3** (CV=0.95) (**down from 3.2** (CV=0.95) based on the 5-year average (2006-2010).

This new information represents the best available science. Therefore, NMFS plans to incorporate the new information referenced in the proposed draft 2014 SAR for sperm whales into a revised negligible impact determination.

At this time PBR estimates have not been developed for sea turtles, because PBR is not part of the ESA regulatory framework. Therefore, under this alternative hard caps for sea turtles are based on the BiOp ITS, as in Alternative 1, but hard caps are not proposed for the two species where no takes have been documented since 2001 (olive ridley and green).

Alternative 3: Hard caps for marine mammals with documented recent (2001-2013) encounters with the DGN fishery with overall hard caps for grouped dolphins and pinnipeds; hard caps for ESA listed sea turtles based on not exceeding the ITS. Species: Include all species in alternative 2 plus groups for pinnipeds and dolphins

Observed interactions and mortalities of protected species and species of concern from the DGN fishery over the last 10 seasons are provided in Table 4. Of the 19 tabulated species, three had no observed interactions and seven had no observed DGN mortality over the 10-year window (as indicated in the yearly max. column). The 10 year average was less than 1 observed animal interaction or mortality for 17/19 species and the maximum number of observed interactions was 0 or 1 for 12/19 species and maximum mortality was 0 or 1 for 13/19 species. Annual average interactions (short-beaked common dolphin = 5.2; California sea lion = 6.7) and mortalities (short-beaked common dolphin = 5.2; California sea lion = 6.6) over the 10 year time window exceeded 1 for two species. One interaction was observed for leatherback and loggerhead sea turtles and no mortalities of any of the four sea turtle species were observed during the period.

Table 4. Observed interactions and mortalities in the DGN fishery over the last 10 seasons, and annual maximums over that window.

Species	Observed interactions*		Observed mortalities*		PBR
	10-yr Avg	10-yr Max	10-yr Avg	10-yr Max	
Cetaceans					
Humpback	0.1	1	0	0	11.0
Fin	0	0	0	0	16.0
Sperm	0.2	2	0.1	1	1.5**
Short-finned pilot	0.2	2	0.2	2	4.6
Minke	0.1	1	0	0	2.0
Grey	0.2	1	0.2	1	558
Short-Beaked Common Dolphin	5.2	9	5.2	9	3,440
Long-Beaked Common Dolphin	1	5	1	5	610
Unidentified Common Dolphin	0.3	1	0.3	1	
Pacific White-sided Dolphin	0.8	3	0.8	3	171
Northern Right Whale Dolphin	0.8	3	0.8	3	48
Risso's Dolphin	0.2	1	0.2	1	39
Bottlenose Dolphin	0.1	1	0.1	1	7.9
Pinnipeds					
California sea lion	6.7	18	6.6	18	9,200
Northern elephant seal	0.2	1	0.2	1	4,382
Turtles					
Leatherback	0.2	1	0	0	N/A
Loggerhead	0.1	1	0	0	N/A
Olive Ridley	0	0	0	0	N/A
Green	0	0	0	0	N/A

* Observed across 2004-05 through 2013-14 seasons, which run from May 1 through Jan 31 of the year intervals.

** Will be 2.7 in draft 2014 SAR

Alternative 4: Hard caps for ESA-listed marine mammals and sea turtles based on levels for which takes are unlikely to trigger a jeopardy determination. Species: sperm and humpback whales; leatherback and loggerhead turtles

This alternative would establish hard caps for the four species for which interactions with the DGN fishery trigger the greatest conservation concern. As alluded to above, the ITS by itself does not trigger a jeopardy determination under the ESA. Takes of ESA-listed species (reported in the ITS) are considered within the context of available information about the status of the listed population and other sources of human-caused mortality to determine jeopardy. A BiOp may identify mandatory actions necessary to avoid jeopardy, which include prohibition of the activity. Thus, the actual take level that would trigger jeopardy may be higher than what is estimated in the ITS. However, NMFS PRD does not estimate or report a threshold for jeopardy a priori, because of the range of circumstantial factors considered in the jeopardy determination process. Under this alternative, hard caps would be proposed that are higher than the estimated takes reported in the ITS but, based on the best available information, judged not to result in jeopardy. These hard caps would be the subject of a new Section 7 consultation once proposed by the Council and forwarded for review by NMFS.

Potential Range of Finfish Bycatch Reduction Alternatives for the DGN Fishery

Bycatch is defined in the MSA as “fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards.” In discussing bycatch it is important to distinguish between the common use of the term bycatch to mean fish which are not targeted in a fishery but may be retained and sold or kept, and the MSA definition, which, in practical terms, applies to fish that are discarded (usually at sea at the time of harvest). Another distinction that can be relevant is between bycatch and bycatch mortality. For some species, such as common mola, bycatch mortality may be quite low. From a stock status standpoint bycatch mortality (a component of total fishing mortality) is a more relevant consideration.

The HMSMT was not able to fully consider a range of alternatives for finfish bycatch reduction but offers three action alternatives for Council consideration.

No Action: Do not establish finfish bycatch reduction measures.

Alternative 1: Bycatch reduction target established as landed catch divided by total catch (retained catch plus alive/dead/unknown discards).

Alternative 2: Bycatch reduction target established landed catch divided by total catch mortality (retained catch plus dead/unknown discards).

Alternative 3: Modify Alternatives 1 & 2 to apply to a subset of bycatch species and/or set targets for groups of species (e.g., common mola, sharks, striped marlin)

The Council will annually review (March or April) fishery performance and recommend bycatch reduction management measures as needed. Management measures could be triggered by annual evaluation of rolling tallies over longer time-spans (e.g., reaching thresholds in any 2 years of a 5 year span could trigger action). The intent is to recognize increased retention of catch as an approach to reduction of discarded bycatch. Alternatives 1 and 2 would establish targets based on a ratio for either total bycatch or bycatch mortality. Bycatch and bycatch mortality is currently reported by observers. For Alternative 2, bycatch mortality would be based on observer reported status of discards (alive/dead/unknown). However, observed discards of live animals likely under-estimates actual survival for some species, because of post-release mortality. Developing bycatch estimates for the fishery as a whole would require expanding the observer estimates. Alternative 3 would allow the Council to focus on particular species for which bycatch is of greater concern. This could be related to stock status or the level of bycatch for that species compared to average for all species.

The HMSMT was not able to resolve how these targets would be implemented in a regulatory context. In general, and consistent with Council guidance, the HMSMT does not favor establishing bycatch targets as quotas, which would be functionally equivalent to a hard cap (i.e., a fishery closes when a quota is attained). Instead, the Council could track bycatch and impose incentives or penalties to reduce bycatch over time. Ideally, management could incorporate individual accountability; the Council has seen that the IFQ system implemented for the groundfish bottom trawl fishery has resulted in bycatch reduction. For example, establishing a bycatch ratio (e.g. swordfish landings to bycatch) applied at the vessel level would be a relatively simple accountability mechanism. However, an individual accountability system would necessitate a higher level of monitoring to be effective. It should also be recognized that bycatch reduction can be accomplished in two ways, by reducing catch of unmarketable (or prohibited) species or finding markets for currently unmarketable species. Individual accountability could incentivize both of these approaches to bycatch reduction. As an alternative to immediately implementing remediation measures, the Council could annually review (at the March or April Council meeting) fishery

performance in relation to established targets and develop bycatch reduction management measures as needed.

DGN Fishery Monitoring Alternatives

Without adequate monitoring it will be difficult to implement hard caps that trigger a fishery closure in real time. Observer coverage in the DGN fishery has been historically funded from the NMFS budget and it is unlikely that additional government funds will be allocated to increase coverage above 30%. In 2013 an emergency rule mandated 100% coverage of DGN vessels in an offshore zone, which resulted in an overall coverage rate of 34.2% for the 2013/14 fishing season (see [Agenda Item E.2.b, NMFS WCR Report](#), June 2014). Based on discussions with observer program staff, the HMSMT based fishery monitoring alternatives on an assumed 30% observer coverage rate.

For the groundfish shore-based IFQ and at-sea whiting fisheries the Council has been considering electronic monitoring (EM) as an alternative to placing observers on fishing vessels. Using EM to detect protected species takes in the DGN fishery has been proven feasible based on a trial conducted by Archipelago Systems, Inc. in 2006-2007. Large finfish species that are typically bycatch, such as mola and blue sharks, can be reliably identified with EM. Although a detailed cost accounting has not been made, deployment of EM is likely to result in lower monitoring costs compared to placing human observers on vessels. Depending on costs and NMFS budget allocations, reduction in observer costs could allow NMFS to reprogram future monitoring funds from at-sea observer deployment to EM deployment.⁴ However, additional trials of EM may be needed, and development of a regulatory framework would be necessary, before EM could be used as a management tool. The Council set a goal of full monitoring of the DGN fishery by the 2016/17 season. Further discussion will be needed to determine if EM could be deployed by then.

Based on the considerations outlined above, the HMSMT identified the following fishery monitoring alternatives:

No Action: Maintain the current 30% target observer coverage level. Hard cap management would have to be based on multi-year total/annual average takes. Estimation procedures that could trigger an “in-season” closure of the fishery would have to be developed.

Alternative 1: Maintain the 30% target observer coverage level but remove the unobservable vessel exemption. Currently, vessels that are determined unsuitable to carry an observer (for safety or accommodation reasons) are exempted from the requirement. Under this alternative the exemption would be removed. Unobservable vessels would not be able to participate in the fishery unless they made necessary upgrades to allow them to carry an observer. (Note that in the groundfish shore-based IFQ fishery, which is subject to 100% observer coverage, there is no such exemption.) Over fishing seasons from 2001 to 2014, 21% of DGN effort (days at sea) has been unobservable (NMFS Observer Program data). Removing the exemption would increase the observer coverage rate if the coverage level for observable vessels remained constant. However, as with any partial observer coverage scenario a reliable estimation procedure would need to be developed for hard cap management.

Alternative 2: Maintain the 30% target observer coverage level and deploy EM on unobservable vessels. The ability to deploy EM on these vessels would have to be confirmed. The monitoring coverage rate (observable days at sea) under this alternative would increase from status quo.

⁴ NMFS budget planning is not under Council control. It should be noted that NMFS may decide to reprogram funds differently, for example towards increasing observer coverage in other fisheries with low or no observer coverage.

Alternative 3: Maintain the 30% target observer coverage level and require EM on all vessels that fish. This alternative would result in 100% monitoring, at least to document protected species takes. Continuing the 30% observer target level would allow accurate estimation of discarded bycatch of commonly caught species. With EM there is a considerable time lag between when an event occurs and when it is documented or confirmed by monitoring. EM stores video imagery and other data, which are periodically downloaded off the vessel (typically by swapping out a memory device when the vessel returns to port). For hard caps to trigger an “in-season” closure EM would likely have to be paired with some kind of self-reporting by the vessel crew. EM would then be used as a compliance monitoring tool (i.e., failing to report a protected species take subsequently documented by EM would trigger a penalty).

Alternative 4: Target observer coverage to a level sufficient for biological sampling and require EM on all vessels that fish. Observer coverage would be reduced to a low level sufficient to collect biological data used for stock assessments and other purposes (e.g., a 5% target coverage level). EM would then be used to document protected species takes with respect to hard cap management and estimate finfish bycatch, at least for larger, commonly caught species such as mola and sharks. The reduction in observer coverage would potentially free up funds that could be allocated to deploying EM. The difficulty of determining takes in-season, so as to trigger a closure if a hard cap is reached, would also apply under this alternative. Again, a reporting requirement backed up by EM as a compliance monitoring tool could be considered.

Implementing a monitoring protocol sufficient for hard cap management is probably the most difficult aspect of the Council’s proposed action. As alluded to in the description of the alternatives above, there are two main issues. They both relate to the fact that given available funding and current technology it is difficult to immediately determine if takes reach a hard cap level that triggers a fishery closure.

First, because protected species takes are rare events, an observed take in any one year represents a small sample, which must be extrapolated from partial observer coverage to the fishery as a whole. For this reason it makes more sense for hard caps to be expressed as a multi-year total or average to allow time for larger sample sizes to be collected, which leads to smaller confidence intervals (e.g., greater certainty in the estimates). Take estimates reported under the MMPA are usually expressed in terms of multiple years for this reason. A statistical procedure would have to be developed to apply to the entire fishery if a take were observed inseason. A reporting system for takes that could be quickly and reliably confirmed would have to be established. Also, the level of fishing effort that had already occurred in that season would need to be determined as part of the take estimation procedure.

Currently, EM systems rely on review of video to document events. Because of the size of stored video files (potentially terabytes of data) it is not practical to upload files wirelessly, especially from vessels at sea, which do not usually have access to high-speed wireless networks. The memory device on board the vessel is swapped out when the vessel returns to port. Someone must then review the video to document the events the system is intended to monitor. EM applications therefore are either used in a compliance capacity or to document events where an immediate response is unnecessary. Hard caps triggering an in-season closure would not be feasible with EM alone. As an alternative, vessel operators could be required to immediately report a take, and if that take triggers a stop fishing control rule, they would cease fishing and return to port. Video files would then be reviewed to confirm the take. Obviously, there would be a strong incentive to not report a take if it threatened closure of the fishery. For that reason the penalty to the individual would have to be sufficiently high so that it outweighed, for the individual, the penalty of a fishery closure. All video files could then be reviewed at the end of the season to detect unreported takes.

DGN Fishery Bycatch Reduction Achievements To-Date

The DGN fishery has undergone extensive changes and regulations over the last two decades. Since implementation in 1997 of final regulations based on Pacific Offshore Cetacean Take Reduction Team (POCTRT) recommendations, gear modifications have included adding acoustic pingers to signal marine mammals of their proximity to the gear and net extenders to allow safe passage past the gear of surface dwelling species (particularly turtles). Since 2001, the Pacific Leatherback Conservation Area (PLCA) has annually closed the primary core of the available DGN fishing habitat from Aug 15 - Nov 15 since 2001. Mandatory VMS inclusion on vessels has allowed time-area monitoring of fleet-wide effort to ensure compliance with regulations, and inclusion of observers on DGN vessels has enabled independent data collection on catch composition to estimate bycatch rates and compliance with regulations. Data collected through the observer program have demonstrated substantial reductions in interactions and mortalities with protected species and species of concern associated with these changes made in the fishery.

The number of permits available to the fishery has been declining consistently, with over 200 permits issued in the early 1980s, down to 126 in 2000, and now 70 permits in 2014. While the decreased effort has been a contributing factor to bycatch reduction, it has also reduced the revenue and profit generated by the fishery.

Seven of the species at risk of entanglement in DGN gear are listed under the ESA (fin, humpback and sperm whales; leatherback, loggerhead, olive ridley and green sea turtles). The 2013 Biological Opinion stated, "NMFS' Opinion concludes that the continued management of the drift gillnet fishery under the US West Coast Highly Migratory Species Fishery Management Plan, given the proposed action, including the protective measures to minimize bycatch of the protected species that have already previously been implemented, is not likely to jeopardize the continued existence of these species, or adversely modify or destroy any critical habitat designated under the ESA".